

F02G

HOT GAS OR COMBUSTION-PRODUCT POSITIVE-DISPLACEMENT ENGINE PLANTS (steam engine plants, special vapour plants, plants operating on either hot gas or combustion-product gases together with other fluid [F01K](#); gas-turbine plants [F02C](#); jet-propulsion plants [F02K](#)); **USE OF WASTE HEAT OF COMBUSTION ENGINES; NOT OTHERWISE PROVIDED FOR**

Definition statement

This place covers:

Hot-gas or combustion product positive-displacement engine plants and use of waste heat of combustion engines, not otherwise provided for.

F02G 1/00

Hot gas positive-displacement engine plants (positive-displacement engine plants characterised by the working gas being generated by combustion in the plant [F02G 3/00](#))

Definition statement

This place covers:

Hot gas positive-displacement engine plants, e.g. Stirling engines.

References

Limiting references

This place does not cover:

Steam engine plants, special vapour plants, plants operating on either hot gas or combustion-product gases together with other fluid	F01K
Gas-turbine plants	F02C
Jet-propulsion plants	F02K

Informative references

Attention is drawn to the following places, which may be of interest for search:

Positive-displacement engine plants characterised by the working gas being generated by combustion in the plant	F02G 3/00
---	---------------------------

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Plant	an engine together with such additional apparatus as is necessary to run the engine. For example, a steam engine plant includes a steam engine and means for generating the steam.
-------	--

F02G 1/043

the engine being operated by expansion and contraction of a mass of working gas which is heated and cooled in one of a plurality of constantly communicating expansible chambers, e.g. Stirling cycle type engine

Definition statement

This place covers:

"Stirling" type engines.

Stirling engines are divided in three types:

- Alpha.

Pairs of sealed pistons in separate cylinders (no displacer).

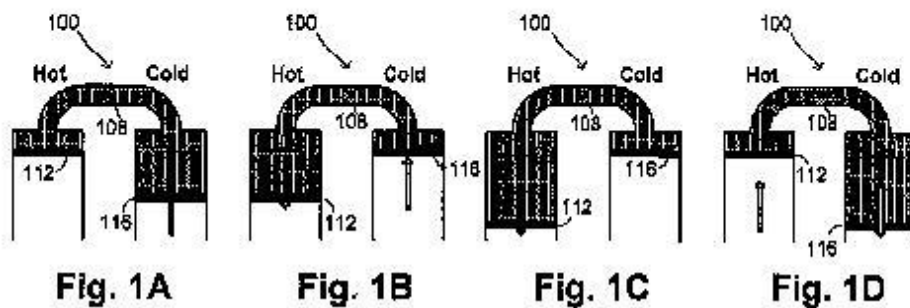
- with parallel pistons.
- with cylinders opposed in line.
- with cylinders opposed parallel.

U.S. Patent

Oct. 5, 2010

Sheet 1 of 7

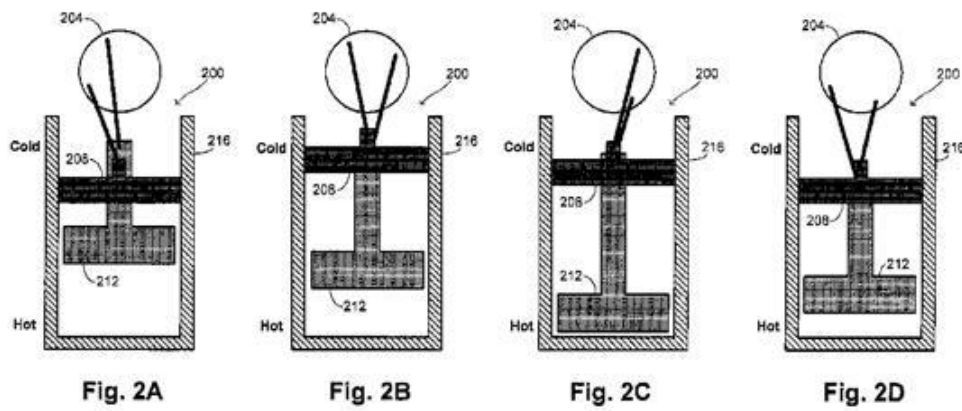
US 7,805,934 B1



- Beta.

Piston - displacer arrangement: piston and displacer in the same

cylinder. Cylinder has a hot end and a cool end:



- Gamma.

Piston - displacer arrangement : piston and displacer in separate cylinders:

U.S. Patent Oct. 5, 2010 Sheet 3 of 7 US 7,805,934 B1

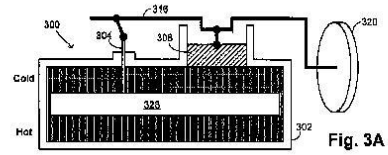


Fig. 3A

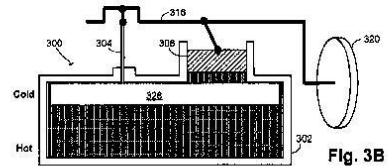


Fig. 3B

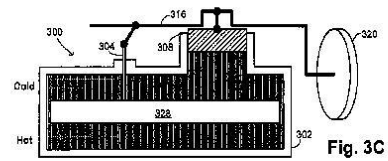


Fig. 3C

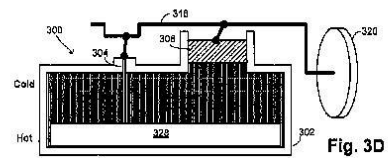
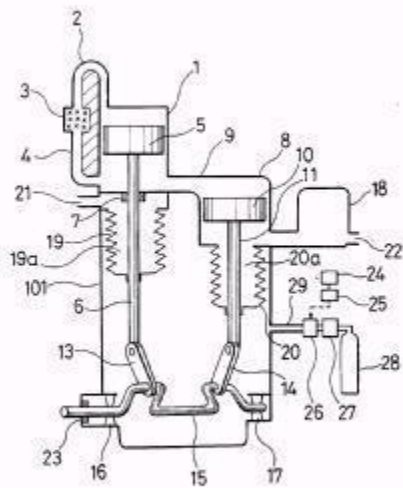


Fig. 3D

F I G 2



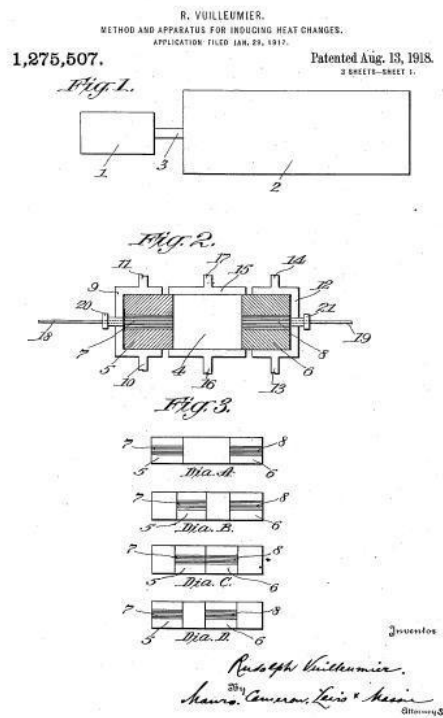
F02G 1/044

having at least two working members, e.g. pistons, delivering power output

Definition statement

This place covers:

Stirling type engine having at least two working members, e.g. pistons, delivering power output. E.g. Vuilleumier cycle:



F02G 3/00

Positive-displacement engine plants characterised by the working gas being generated by combustion in the plant

Definition statement

This place covers:

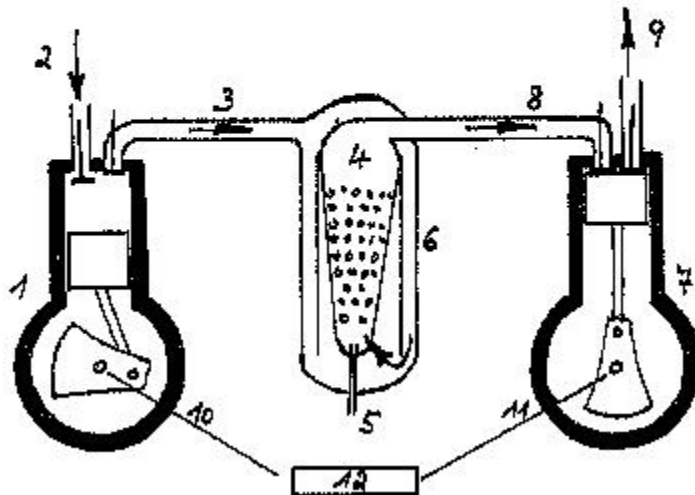
Positive-displacement engine plants characterised by the working gas being generated by combustion in the plant, e.g. positive displacement engine plants with external combustion:

IGEN SEITE 1

Nummer:
Int. Cl. 8:
Offenlegungstag:

DE 107 46 945 A1
F 02 G 1/02
29. April 1999

Fig. 1 Brennkraftmaschine als Hubkolbenmaschine (Variante I)



References

Limiting references

This place does not cover:

Stirling engines	F02G 1/043
------------------	----------------------------

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Plant	an engine together with such additional apparatus as is necessary to run the engine. For example, a steam engine plant includes a steam engine and means for generating the steam.
-------	--

F02G 5/00**Profiting from waste heat of combustion engines, not otherwise provided for****Definition statement**

This place covers:

Profiting from waste heat of combustion engines, not otherwise provided for, e.g. converting heat directly to electric power via a thermoelectric generator using the Seebeck effect or converting the waste heat to mechanical power using a Rankine cycle.

References**Limiting references**

This place does not cover:

Vehicle heating derived from propulsion plant	B60H 1/02
Exhaust or silencing apparatus combined or associated with devices profiting by exhaust heat	F01N 5/02